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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/898,386	07/05/2001	Shui-Hung Chen	TS00-424	3633

7590 06/26/2002

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EXAMINER
NADAV, ORI

ART UNIT	PAPER NUMBER
2811	

DATE MAILED: 06/26/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/898,386	CHEN ET AL.	
	Examiner	Art Unit	
	ori nadav	2811	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 May 2002* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 112

1.The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claimed limitation of an n-well region "not overwise connected", as recited in claims 1, 8 and 14, is unclear as to what is meant by the term "otherwise" to what element(s) the n-well region is not connected.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-20, insofar as in compliance with 35 U.S.C. 112, are rejected under 35 U.S.C. 103(a) as being unpatentable over Voogel (5,959,821) or Yu (5,742,085) in view of Amerasekera (5,949,094).

Voogel teaches in figure 3 an electrostatic discharge protection device comprising: a p region of a semiconductor substrate 310; an n+ region 312 in the p region wherein the n+ region is connected to a first voltage supply (ground); an n-well region 320 in the p region wherein the n+ region is spaced from the n-well region a distance such that a depletion region extends therebetween during normal operation; and a p+ region 324 in the n-well region wherein the p+ region is connected to a second voltage supply 165 of greater value than the first voltage supply during the normal operation wherein current is conducted through the n+ region to the p+ region during an electrostatic discharge event.

Although Voogel does not explicitly state that the n+ region is spaced from the n-well region a distance such that a depletion region extends therebetween during normal operation, this feature is inherent in Voogel's device, because during normal operation current is conducted through the n+ region to the p+ region and thus a depletion region is formed therebetween.

Voogel does not an n-well ESD device formed in a p-well region.

Yu teaches in figure 4 an electrostatic discharge protection device comprising: a p region of a semiconductor substrate 5, an n+ region 52 in the p region wherein the n+

region is connected to a first voltage supply (ground); an n-well region 50 in the p region wherein the n+ region is spaced from the n-well region a distance such that a depletion region extends therebetween during normal operation; and a p+ region 502 in the n-well region wherein the p+ region is connected to a second voltage supply 1 of greater value than the first voltage supply during the normal operation wherein current is conducted through the n+ region to the p+ region during an electrostatic discharge event.

Although Yu does not explicitly state that the n+ region is spaced from the n-well region a distance such that a depletion region extends therebetween during normal operation, this feature is inherent in Yu's device, because during normal operation current is conducted through the n+ region to the p+ region and thus a depletion region is formed therebetween.

Yu does not an n-well ESD device formed in a p-well region.

Amerasekera teaches in figure 3 an n-well 5' ESD device formed in a p-well region 3'.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to form Voogel or Yu's device in a p-well in order to provide better electrical isolation for the device.

Regarding claim 14, Voogel and Yu teach in figures 3 and 4, respectively, a ground pad Vss connected to an external ground reference Vss and to a p+ region 314 and 53,

respectively, in the p substrate. Note that the broad recitation of the claim does not preclude the external ground reference Vss from being connected to the first voltage supply.

Regarding claims 2, 9 and 15, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use a p-well region comprises a dopant concentration of between about 1xE15 atoms/cm3 and 1xE16 atoms/cm3 in Voogel or Yu's device, since it is within the skills of an artisan, subject to routine experimentation and optimization to find the optimum dopant concentration of the device.

Regarding claims 3, 10 and 16, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use an n-well region comprises a dopant concentration of between about 5xE15 atoms/cm3 and 5xE16 atoms/cm3 and a junction depth of between about 0.3 microns and 1.0 microns in Voogel or Yu's device, since it is within the skills of an artisan, subject to routine experimentation and optimization to find the optimum dopant concentration of the device.

Regarding claims 4, 11 and 17, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use an n+ region comprises a dopant concentration of between about 1xE20 atoms/cm3 and 1xE22 atoms/cm3 and a junction

depth of between about 0.1 microns and 0.3 microns in in Voogel or Yu's device, since it is within the skills of an artisan, subject to routine experimentation and optimization to find the optimum dopant concentration of the device.

Regarding claims 5, 8 and 18, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use a distance between the n+ region and the n-well region between about 0.2 microns and 1.0 microns in Voogel or Yu's device, since it is within the skills of an artisan, subject to routine experimentation and optimization to find the optimum dopant concentration of the device.

Regarding claims 6-7, 12-13 and 19-20, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use first and second voltage supplies is between about 1.0 Volts and 5.0 Volts referenced to the p-well region during the normal operation in Voogel or Yu's device, since it is within the skills of an artisan, subject to routine experimentation and optimization to find the optimum dopant concentration of the device.

Response to Arguments

5. Applicant's arguments with respect to claims 1-20 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Reference D is cited as being related to an ESD device.

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Papers related to this application may be submitted to Technology center (TC) 2800 by facsimile transmission. Papers should be faxed to TC 2800 via the TC 2800 Fax center located in Crystal Plaza 4, room 4-C23. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The Group 2811 Fax Center number is (703) 308-7722

and 308-7724. The Group 2811 Fax Center is to be used only for papers related to Group 2811 applications.

Any inquiry concerning this communication or any earlier communication from the Examiner should be directed to *Examiner Nadav* whose telephone number is **(703) 308-8138**. The Examiner is in the Office generally between the hours of 7 AM to 4 PM (Eastern Standard Time) Monday through Friday. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas, can be reached at **(703) 308-2772.**

Any inquiry of a general nature or relating to the status of this application should be directed to the **Technology Center Receptionists** whose telephone number is **308-0956**

Tom Thomas

TOM THOMAS
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800

Ori Nadav

June 19, 2002